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EXAMINER

CIRIC, LJILJANA V

ART UNIT	PAPER NUMBER
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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Paper No. 14

Application Number: 09/410,896

Filing Date: October 2, 1999

Appellant(s): Ching-Hsing Shih, His-Shen Chuang, and Chen-Fang Chung

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Randy W. Tung, Registration No. 31,311

For Appellant

**EXAMINER'S ANSWER**

This is in response to the revised appeal brief filed on May 20, 2002.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement indicating that there are no related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is essentially correct, except that the summary refers to non-existent "linear

grooves 36". This appears to be a typographical error; "linear grooves 36" should be referred to as "linear grooves 76" in the summary of the invention. See Figure 3A of the instant application.

Also please note that the "first plurality" refers to the plurality of concentrically formed circular grooves 74 while the "second plurality" refers to the plurality of radially formed linear grooves 76.

#### **(6) Issues**

The appellant's statement of the issues in the brief is correct, except with regard to the listing of the claims corresponding to Issue II. In the appellant's statement of the issues, appellant questions whether "the rejection of claims 1-3, 5, 8-10, **12-15 and 19** under 35 USC § 103(a) as being unpatentable over Moslehi '745" is proper. The latter appears to be in error because: claims 1 through 3, 5, 8 through 10, **12 through 16, and 18 through 20** stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Moslehi '745; appellant contests all of these claims as a single group; claim 19 depends from claim 16; and, on page 8 of the revised appeal brief, appellant states that "The rejection of claims 1-3, 5, 8-10, **12-16 and 18-20** under 35 USC § 103(a) based on Moslehi is improper and must be reversed". Therefore, the appellant's statement of the issues with regard to the claims corresponding to Issue II is understood to correspond to claims 1 through 3, 5, 8 through 10, 12 through 16, and 18 through 20 and not just to claims 1 through 3, 5, 8 through 10, 12 through 15, and 19 as cited in the statement of the issues.

**(7) Grouping of Claims**

Appellant's brief includes a statement that claims 1 through 3, 5, 8 through 10, 12 through 16, and 18 through 20 stand or fall together. Appellant's request that all of the claims stand or fall together appears to ignore the fact that while all of claims 1-3, 5, 8-10, 12-16 and 18-20 are rejected under 35 U.S.C. § 103(a) as a group, claims 16, 18, and 20 are separately and alternately rejected under 35 U.S.C. § 102(e). The broadest claim rejected under 35 U.S.C. § 102(e) is base claim 16, which is also the broadest claim rejected under 35 U.S.C. § 103(a).

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

6,081,414	Flanigan et al.	6-2000
6,138,745	Moslehi	10-2000

**(10) Grounds of Rejection**

The following grounds of rejection are applicable to the appealed claims:

Claim 12 stands rejected under 35 U.S.C. § 112, second paragraph. This rejection is set forth in the prior Office action, Paper No. 7. Please note that appellant is not contesting the above rejection. See top of page 2 of the revised appeal brief.

Claims 16, 18, and 20 stand rejected under U.S.C. § 102(e) as being anticipated by Flanigan et al. (filed May 1, 1998). As noted in the prior Office action, Paper No. 7, Flanigan et al. discloses a wafer pedestal 104 having a substantially planar top surface with at least three concentrically formed circular grooves and with at least two radially formed linear grooves formed in the top surface of pedestal 104, every one of the linear grooves being in fluid communication with each and every one of the at least three circular grooves. Note that Figure 2 of Flanigan et al. shows five concentrically formed circular grooves and at least five radially formed linear grooves in the top surface of pedestal 104. Flanigan et al. also discloses that a reactant gas such as argon [see column 7, line 23] is introduced via one of the remote gas sources 130 or 134. More specifically, the reactant gas such as argon flows from remote gas source 130 or 134 to the grooves in the top surface of pedestal 104 via gas conduit 142 and opening 210 [see Figure 2 in conjunction with Figure 2]. The reference thus reads on claims 16, 18, and 20.

Claims 1 through 3, 5, 8 through 10, 12 through 16, and 18 through 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Moslehi. Moslehi discloses an apparatus and a method for cooling a semiconductor substrate 14 or 64 essentially as claimed, the pedestal or chuck 36 including chuck body 38 comprising a substantially planar top surface characterized by a plurality (i.e., at least two as shown in Figure 3) of circular concentric grooves 88 and a plurality of linear radial grooves 90 (i.e., eight as shown in Figure 3) which intersect each other [see column 7, lines 3-9] and

which are thus in fluid communication with each other. Moslehi, however, does not specify that the dimensions of grooves 88 and 90 as having any particular value or range of values nor does it show more than two circular concentric grooves 88 which are intersected by each and every one of linear radial grooves 90. Nevertheless, appellant's originally filed disclosure and subsequently filed arguments have failed to establish any criticality or any unexpected results corresponding to either the particular dimensions of the various grooves or to the number of circular concentric grooves. In fact, the original disclosure merely presents **exemplary or preferable**, (as opposed to critical) values or ranges of values corresponding to the dimensions and numbers of grooves. See lines 13-16 on page 8, lines 12-15 on page 9, the amended paragraph on page 11, and especially line 20 on page 12 and lines 1-2 on page 13. The last two citations in particular indicate that the dimensions of the grooves are merely illustrative and not at all critical. Thus, absent a showing of criticality and unexpected results, it is still held that it is not inventive to merely optimize the size (such as the width and depth) of the grooves, nor to duplicate or change the number of circular grooves for example for a multiplied effect (such as to provide additional heat transfer area or to allow more cooling fluid to flow therethrough). See In re Reven, 156 USPQ 679 (CCPA 1968). Also see St. Regis Paper Co. V. Bemis Co., Inc., 193 USPQ 8, 11 (7th Cir. 1977). It would thus have been obvious to one skilled in the art at the time of the invention to modify the number and the particular dimensions of the grooves of the substrate of Moslehi in order to, for

example, enhance the transfer of heat between the chuck body 38 and the substrate 14 or 64 in order to best meet the particular cooling requirements corresponding to the given substrate such as by allowing more heat transfer enhancing gas flow between the chuck body 38 and the substrate 14 or 64 [see column 6, lines 55-58].

**(11) Response to Arguments**

With regard to the Flanigan et al. reference as applied by the examiner, the appellant's remarks and arguments are not persuasive because they are based on the intended use (i.e., general heat transfer vs. cooling only) of the apparatus, whereas the standard is that if the prior art structure is capable of performing the intended use (i.e., cooling only), then it meets the claim. In the instant case, the grooves in the top surface, while specifically disclosed as enhancing heat transfer in general by providing a larger heat transfer area and allowing more gas to flow therethrough, are nevertheless fully capable of enhancing cooling or any other type of heat transfer equally well. Flanigan et al. thus meets the claims. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, 136 USPQ 458, 459 (CCPA 1963).

It is furthermore respectfully submitted that appellant's argument that grooves 236 are provided for cooling in the apparatus disclosed by Flanigan et al. is irrelevant.

Finally, also with regard to appellant's arguments relating to the applicability of the Flanigan et al. reference, it is hereby noted that claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. See In re



Danly, 263 F.2d 844, 847 120 USPQ 528, 531 (CCPA 1959). It is respectfully submitted hereby that appellant has failed to distinguish the instant invention from the Flanigan et al. prior art reference in terms of structure per se. Also, "[A]pparatus claims cover what an device *is*, not what a device *does*. (Emphasis in original). See Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In response to applicant's argument that the Moslehi reference fails to show certain features of applicant's invention, it is noted that the features upon which appellant relies (i.e., that the first plurality of circular grooves necessarily refers to at least three grooves, and not merely to simply refer to more than one groove as interpreted by the examiner based on the standard meaning of the term "plurality" as being equivalent to "more than one") are not recited in the rejected base claims 1 and 8. Although the claims are interpreted in light of the specification, contrary to appellant's arguments, the limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin,

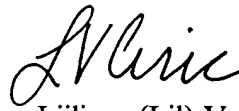
443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The level of ordinary skill in each of the semiconductor wafer processing art and the heat transfer art is generally at least that corresponding to someone having at least a basic technical degree, ranging from a minimum of a two-year technical degree for technicians and some designers to a minimum of a four-year degree in engineering for most engineers and designers practicing in these arts. The average person with either a two-year or a four-year degree in a relevant technical discipline would have the knowledge and the training and the reasoning ability to add additional concentric circular grooves or channels to the apparatus disclosed by Moslehi in order to, for example, allow a larger amount of gas flow as needed to support enhanced heat transfer at the interface. Similarly, such a person of ordinary skill in the art of heat transfer would also know enough to select the width and the depth of the grooves in order to meet the particular heat transfer requirements of a given substrate vacuum processing operation.

With regard to appellant's argument that the Moslehi reference does not teach or disclose the particular dimensions for the various grooves or gas channels, it is hereby reiterated that, absent a showing of criticality or unexpected results, changes in the size and/or the size range of an element are not a matter of invention but of ordinary design choice. Furthermore, appellant, at the top of page 13 of the specification, admits that the cited dimensions are "merely used for illustration purpose, any other suitable dimensions may be utilized equally advantageously in the present apparatus and method." This statement is taken to mean that not only are the dimensions not

critical, but that there are any number of suitable dimensions and that these dimensions are determinable as a matter of design choice and are thus not part of the invention.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

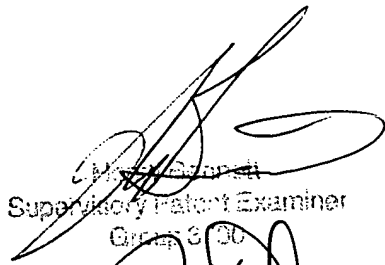
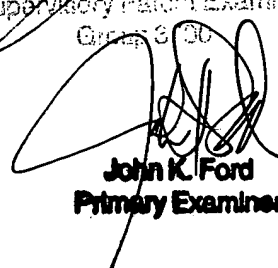
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August 16, 2002

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